



Integrated Planning in Action 2014 Springfield Water and Sewer Commission Integrated Wastewater Plan

Springfield, Massachusetts

Riverfront Park with Memorial Bridge in the background.
Photo courtesy of Jaimye Bartak, SWSC.

Springfield is the third largest city in Massachusetts, with a population of about 155,000. The Springfield Water and Sewer Commission is an independent regional public utility that operates combined and separate sanitary sewer systems that transport wastewater to a wastewater treatment facility. This facility and portions of the city’s storm sewer system discharge into the Connecticut River—the longest river in New England and one of only two American Heritage Rivers in New England. The Connecticut River in Springfield is a popular recreational venue. Along with fishing and boating, the Connecticut River Walk and Bikeway includes a 4-mile stretch along the Springfield riverfront that is popular for walking, jogging, biking, and rollerblading.

Challenges

Springfield is an older post-industrial city with aging infrastructure. Springfield has experienced frequent combined sewer overflows (CSOs), which discharge sewage into the Connecticut, Chicopee, and Mill Rivers. During heavy rain events, stormwater enters the Commission’s combined and separate sanitary sewer system, causing CSOs and sanitary sewer overflows (SSOs) because of lack of system capacity. The Commission had reduced SSOs by 70 percent between 2006 and 2013 and wanted to further reduce these discharges.

Springfield’s wastewater treatment facility is also the largest contributor to the Connecticut River Watershed’s total nitrogen loading. In 2001, a total maximum daily load (established for Long Island Sound, into which the watershed drains) required the facility to reduce nitrogen loading. Without a long-term plan to maintain aging infrastructure and meet Clean Water Act requirements, the Commission struggled with prioritizing projects that address CSO and SSO events, as well as future nutrient reduction requirements at the wastewater treatment facility.

The Commission invested \$100 million between 2000 and 2012 to reduce CSOs as required by a series of administrative orders and based on a draft 2000 long-term control plan (LTCP). The administrative order issued by EPA in 2008 required the Commission to finalize its LTCP to reduce CSO volume by 85 percent. Understanding the competing needs of CSO compliance projects and other infrastructure renewal projects, the Commission recognized that the Integrated Planning Framework would allow for an adaptable approach to prioritize all the utility’s wastewater needs.



EPA Region 1

155,000 population



Integrated Planning in Action

Between 2012 and 2014 the Commission performed comprehensive evaluations and condition assessments of all its wastewater assets by implementing a robust asset management program. That program's data-driven strategy helped create a prioritized list of needs based on risk and consequence of failure. In 2014, the Commission began the integrated planning process in order to address the high-risk infrastructure and renewal projects while also meeting CSO obligations faster and more cost-effectively. The Commission began by prioritizing the 2012 LTCP CSO projects and wastewater capital improvement projects based on CSO volume reduction and human health benefits. The Commission sequenced the highest-volume, most cost-effective CSO projects first, thereby reducing financial burden on ratepayers. This allowed Springfield the financial flexibility to implement wastewater capital improvement projects to improve the resiliency and reliability of its system. Projects such as sewer rehabilitation and a pumping station renewal project could be implemented more quickly to help the Commission achieve CSO reduction milestones and improve operational performance at the wastewater treatment facility.

The Commission's proposed integrated plan schedule included six phases of CSO projects over 20 years and 11 phases of wastewater capital improvements over 40 years. The CSO projects were sequenced to reduce projected CSO volume by over 50 percent within the first two phases—more quickly than what would have been achieved by implementing the original LTCP. Integrated plan projects proposed later in the schedule balanced further CSO reductions with capital improvements necessary to maintain infrastructure and address SSOs.



Springfield Dragon Boat Festival on the Connecticut River. Photo courtesy of Mark M. Murray.

The broader system understanding achieved through the integrated planning process, along with a better understanding of financial conditions, capabilities, and rate impacts, allowed the Commission to better evaluate a variety of alternatives and choose projects with multiple benefits across key metrics. The box below shows the secondary benefits the Commission expected to gain.

The total cost of the integrated plan through 2035 was projected to be \$447.2 million. The plan estimated an 89 percent annual CSO volume reduction upon completion.

Results

The Commission's *Integrated Wastewater Plan* was implemented in a 2014 administrative order from EPA, which required Springfield to complete the second and third phases of CSO improvements. Initial projects reduced CSO discharge volume and SSO events: CSO volume dropped 56 percent from baseline levels in 2017 and the number of SSO events decreased by 47 percent from 2014 to 2019. In 2018, based on outcomes from its asset management ranking system, the Commission completed rehabilitation of a major interceptor sewer project.

Secondary Benefits from the Integrated Planning Process

- Risk reduction
- Better system reliability
- Better performance
- More resiliency
- More long-term rate stability